CLAIMS

1. An electrically controllable device having variable optical and/or energy properties or an electroluminescent device, comprising at least one carrier substrate (1, 1') carrying an electroactive multilayer stack (3) that is placed between an electrode called the "lower" electrode and an electrode called the "upper" electrode, each electrode comprising at least one electrically conducting layer (2, 2') in electrical connection with at least one current bus, ***characterized in that*** at least one of the current buses is in electrical connection with at least one current lead comprising either conducting wires (4) or a network of wires running over or within the layer (2, 2') forming the electrode suitable for distributing, over the surface of at least one of the conducting layers (2, 2'), electrical energy so as to convert the electrical energy into light uniformly within the electroactive multilayer stack (3).

2. The device as claimed in claim 1, ***characterized in that*** the conducting wires (4) are metal wires, for example made of tungsten (or copper), optionally covered with a surface coating, with a diameter of between 10 and 100 μm and preferably between 20 and 50 μm, which are straight or corrugated, and deposited on a sheet of thermoplastic (5).

3. The device as claimed in claim 1 or claim 2, ***characterized in that*** the "lower" electrode comprises an electrically conducting layer (2) covering a region of the carrier substrate, especially one that is essentiallly rectangular, the lower electrode (2) being based on a doped metal oxide, especially tin-doped indium oxide called ITO or fluorine-doped tin oxide F:SnO_2, or aluminum-doped zinc oxide Al:ZnO for

example, optionally deposited on a prelayer of the silicon oxide, oxycarbide or oxynitride type, having an optical function and/or an alkali metal barrier function when the substrate is made of glass.

4. The device as claimed in claim 1 or claim 2, ***characterized in that*** the conducting layer (2) forming the "lower" electrode may be a bilayer formed from an SiOC first layer of between 10 and 150 nm, especially 20 to 70 nm and preferably 50 nm thickness, surmounted by an F:SnO_2 second layer of between 100 and 1000 nm, especially 200 to 600 nm and preferably 400 nm thickness.

5. The device as claimed in claim 4, ***characterized in that*** it comprises a bilayer formed from a first layer based on SiO_2 doped with a little metal of the Al or B type, about 20 nm in thickness, surmounted by an ITO second layer of about 100 to 300 nm thickness.

6. The device as claimed in claim 4, ***characterized in that*** it comprises a layer formed from ITO about 100 to 300 nm in thickness.

7. The device as claimed in claim 1, ***characterized in that*** the active system (3) is made up of a multilayer stack comprising: at least one HIL layer (3a) based on an unsaturated, especially polyunsaturated, heterocyclic compound such as a copper or zinc phthalocyanine or a PEDT/PSS compound 5 nm in thickness; an HTL layer (3b), 50 nm in thickness, of N,N'-diphenyl-N,N'bis(3-methylphenyl)-1,1'-biphenyl-4,4'diamine (TPD) or N,N'-bis-(1-naphthyl)-N,N'-diphenyl-1,1'-biphenyl-4,4'-diamine (α-NPD); a layer (3c), 100 nm in thickness, of evaporated molecules of the complex AlQ_3 (aluminum tris(8-hydroxyquinoline)) optionally doped with a few percent of rubrene, DCM or quinacridone; and an ETL layer (3d), 50 nm in thickness, of 2-(4'-biphenyl)-5-(4"-*tert*-butylphenyl)-

1,3,4-oxadiazole (*t*-Bu- PBD) or 3-(4'-biphenyl)-4-phenyl-5-(4"-*tert*-butylphenyl)-1,2,4-triazole (TAZ).

8. The device as claimed in claim 1, ***characterized in that*** the active system (3) is made up of a mutilayer stack comprising: at least one HIL layer (3a) made of PEDT/PSS 50 nm in thickness; and a layer (3b) of polymers based on PPV, PPP, DO-PPP, MEH-PPV or CN-PPV, 100 nm in thickness.

9. The device as claimed in claim 1, ***characterized in that*** the active system (3) is made up of a multilayer stack comprising: at least one layer (3a) based on an active material 500 nm in thickness, such as for example sulfides like Mn:ZnS, Ce:SrS, or MN:Zn_2SiO_4, Mn:Zn_2GeO_2 or Mn:$ZnGa_2O_4$, this layer (3a) being joined on either side to insulating layers (3e, 3f) made of a dielectric (Si_3N_4, Al_2O_3/TiO_2 or $BaTiO_3$) with a thickness of 150 nm.

10. The device as claimed in claim 1 and claim 9, ***characterized in that*** the electrically conducting layer (2') forming the upper electrode is based on a metal or metal alloy of aluminum.

11. The device as claimed in claim 1 and claims 7 and 8, ***characterized in that*** the electrically conducting layer forming the upper electrode (2^1) is based on an electropositive metal (Al, Mg, Ca, etc.) or an alloy of said metals.

12. The device as claimed in one of the preceding claims, ***characterized in that*** at least one of the two electrodes, preferably the "upper" electrode, comprises an electrically conducting layer joined to a network (4) of conducting wires/conducting strips.

13. The device as claimed in claim 12, ***characterized in that*** the conducting network (4) comprises a

plurality of essentially metallic wires placed on the surface of a sheet (5) of polymer, especially of the thermoplastic type.

14. The device as claimed in claim 12 or claim 13, ***characterized in that*** the wires/strips (4) are placed essentially parallel to one another, preferably in an orientation essentially parallel to the length or the width of the electrically conducting layer (2') of the "upper" electrode, the ends of said wire/strips extending beyond the substrate region covered by said electrically conducting layer on two of its opposed edges, especially by at least 0.5 mm.

15. The device as claimed in one of claims 12 to 14, ***characterized in that*** the ends of the wires/strips (4) joined to the electrically conducting layer (2) of the "lower" electrode are electrically connected to current buses in the form of flexible strips (6a, 6b) made of insulating polymer, these being covered on one of their faces with a conductive coating.

16. The device as claimed in claim 15, ***characterized in that*** said current buses are in the form of conducting clips that grip the carrier substrate (1, 1').

17. The device as claimed in claim 15, ***characterized in that*** the set of current buses for the "lower" and "upper" electrodes are brought together in the form of a strip of approximately rectangular shape, formed from an electrically insulating and flexible polymer support, with, on two opposed edges, a conductive coating on one face and, on its other two edges, a conductive coating on the face on the opposite side from the previous one, preferably with a single external electrical connector.

18. The device as claimed in one of the preceding

claims, ***characterized in that*** at least one of the current buses is in the form of a shim (14a, 14b, 15a, 15b), especially a metal strip, or in the form of one or more conducting wires, or in the form of a point lead made of conducting material.

19. The device as claimed in one of the preceding claims, ***characterized in that*** the electroactive stack (3) covers a carrier substrate region which is a polygon, a rectangle, a diamond, a trapezoid, a square, a circle, a semicircle, an oval or any parallelogram.

20. The device as claimed in one of the preceding claims, ***characterized in that*** it makes up an electroluminescent system.

21. The device as claimed in claim 20, ***characterized in that*** the system is transparent.

22. The device as claimed in claim 20, ***characterized in that*** it is an electroluminescent glazing unit, especially of laminated structure.

23. The device as claimed in claim 20, ***characterized in that*** the electroluminescent glazing unit comprises at least one flat glass pane and/or at least one curved glass pane.

24. The device as claimed in one of claims 20 to 23, ***characterized in that*** it also includes at least one of the following coatings: an infrared-reflecting coating, a hydrophilic coating, a hydrophobic coating, a photocatalytic coating with anti-fouling properties, an anti-reflection coating, an electromagnetic shielding coating.

25. The device as claimed in one of claims 20 to 23, characterized in that the carrier substrate (1) is rigid, semirigid or flexible.

26. The use of a device as claimed in any one of claims 1 to 24 as glazing for automobiles or buildings.